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·科技快讯·

采用机器学习方法替代肢体损伤严重程度评分预测下肢创伤相关动脉损伤患者是否需要截肢

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肢体损伤严重程度评分被用于评估下肢创伤相关动脉损伤患者截肢必要性已经30余年。30年来，随着血管、创伤和矫形外科的发展，传统的肢体损伤严重程度评分在敏感性上已经过时。同时，相当一部分患者首诊住院未截肢而在出院后30 d再住院期间接受了截肢手术，这部分患者数据在以往的分析中未获得重视。该研究开发了一种基于机器学习的创伤后截肢预测模型。研究人员从美国全国再入院数据库筛选出1 098例伴有动脉损伤的严重下肢创伤性骨折成年患者，共有206例（18.8%）接受了截肢，其中176例患者在首次入院时进行了截肢，30例患者在首次入院治疗痊愈出院30 d内再入院时进行了截肢。研究者首先确定了与创伤后截肢相关的危险因素，然后使用极限梯度提升算法、随机森林算法以及逻辑回归算法分别开发了基于机器学习的创伤后截肢预测模型。对比结果表明，逻辑回归算法的预测能力最强，其精确度为0.88、敏感度为0.47、特异度为0.98。考虑到样本数量在截肢（18.8%）和没有截肢（81.2%）患者之间的不平衡，作者又使用了未遂事件采样算法来提高预测的敏感度，将敏感度提高到0.71，但是精确度降低到0.74，特异度降低到0.75。作者最后得出结论：基于机器学习的预测模型结合采样算法，可以帮助识别具有截肢高风险的下肢毁损伤患者，指导采取针对性的干预；同时作者认为，未来将此类预测模型嵌入电子病历系统，自动获取患者关键信息，实时评估截肢必要性，将有助于临床医师决策。

何志友，编译自《J Am Coll Surg》，2021，232（1）：102-113.e4；张丕红，审校